

PATENT COOPERATION TREATY

SJR

From the INTERNATIONAL SEARCHING AUTHORITY

To:
STEVEN J. ROCCI
WOODCOCK WASHBURN LLP
ONE LIBERTY PLACE, 46TH FLOOR
PHILADELPHIA, PA 19103

RECEIVED

NOV 08 2005

PCT

(A6)

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's file reference
MSFT-4439

RECEIVED

FOR FURTHER ACTION See paragraphs 1 and 4 below

International application No.
PCT/US04/24565

NOV 11 2005

International filing date
(day/month/year) 29 July 2004 (29.07.2004)

Applicant
MICROSOFT CORPORATION

Mary Ann Devino

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 17

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes
1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 338.82.70.

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ With regard to the protest against payment of additional fee(s) under Rule 40.2, the applicant is notified that:

- ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.
- ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. Reminders

Shortly after the expiration of 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within 19 months from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later); otherwise, the applicant must, within 20 months from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of 30 months (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the ISA/US
Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
Facsimile No. (571) 273-8300

Authorized officer

Jack M. Choules

Telephone No. 571-272-2100

Form PCT/IB/301 (January 2004)

(See notes on accompanying sheet)

NOV 08 2005

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INACTIVE

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
STEVEN J. ROCCI
WOODCOCK WASHBURN LLP
ONE LIBERTY PLACE, 46TH FLOOR
PHILADELPHIA, PA 19103

PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing
(day/month/year)

04 NOV 2005

Applicant's or agent's file reference
MSFT-4439

FOR FURTHER ACTION See paragraphs 1 and 4 below

International application No.
PCT/US04/24565

International filing date
(day/month/year) 29 July 2004 (29.07.2004)

Applicant
MICROSOFT CORPORATION

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes
1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 338.82.70.

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

Shortly after the expiration of 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within 19 months from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later); otherwise, the applicant must, within 20 months from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of 30 months (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the ISA/ US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
Facsimile No. (571) 273-8300

Authorized officer

Jack M. Choules

Telephone No. 571-272-2100

Form PCT/ISA/220 (January 2004)

(See notes on accompanying sheet)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference MSFT-4439	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US04/24565	International filing date (<i>day/month/year</i>) 29 July 2004 (29.07.2004)	(Earliest) Priority Date (<i>day/month/year</i>) 03 May 2004 (03.05.2004)
Applicant MICROSOFT CORPORATION		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the Report

- a. With regard to the language, the international search was carried out on the basis of:



the international application in the language in which it was filed.



a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

- b. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. ☐ Certain claims were found unsearchable (See Box No. II)

3. ☐ Unity of invention is lacking (See Box No. III)

4. With regard to the title,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the abstract,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

- a. the figure of the drawings to be published with the abstract is Figure No. 4A



as suggested by the applicant.



as selected by this Authority, because the applicant failed to suggest a figure.



as selected by this Authority, because this figure better characterizes the invention.

- b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/24565

Box IV TEXT OF THE ABSTRACT (Continuation of Item 5 of the first sheet)

The technical features mentioned in the abstract do not include a reference sign between parentheses (PCT Rule 8.1(d)).

NEW ABSTRACT:

The present invention relates generally to database and file system management and, more particularly, to automatic database and file system maintenance and repair to ensure data reliability. Various aspects of the present invention relate to responding and correcting data corruptions at a data page level (482) for all data page types, as well as to recovery, including rebuild or restore operations, for various scenarios including, without limitation, index page corruptions (488), clustered and non-clustered, data page corruptions (492), and page corruptions in the log file (496).

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/24565

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06F 17/30

US CL : 707/202, 714/16, 19, 20

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 707/200-204, 714/15-20, 701

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Bullock et al, Recovery of data Pages After Partial Page Writes, IBM Technical Disclosure Bulletin, August 1991, Vol. 34, No. 3, pages 69-83, especially pages 69-72 and 74-83.	1-3, 11-13, 21-23
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Y		4-10, 14-20, 24-30
Y	US 4,945,474 A (ELLIOTT et al) 31 July 1990 (31.07.1990) column 8, lines 44-61, column 10 lines 7-55)	4, 7-10, 14, 17-20, 24 and 27-30
Y	US 6,671,699 B1 (BLACK et al) 30 December 2003 (30.12.2003), column 36, lines 30-55)	5, 15, 25
Y	Microsoft Press Computer Dictionary, third edition, 1997, pages 39 and 40, especially pages 39 and 40.	6, 16, 26
X	US 6,314,433 B1 (MILLS et al) 06 November 2001 (06.11.2001), column 4-5.	1, 11, 21
Y	Ponnekanti et al, Online Index Rebuild, Proceedings of the 2000 AMC SIMOD International Conference on Management of Data, 2000 pages 529-538, especially page 529.	2, 8, 12, 18, 22, 28
A	Levy et al, Incremental Recovery in Main Memory Database Systems, IEEE Transactions on Knowledge and Data Engineering, December 1992, Vol. 4, No. 6, pages 529-540, all relevant.	1-30

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

13 October 2005 (13.10.2005)

Date of mailing of the international search report

04 NOV 2005

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (571) 273-8300

Authorized officer

Jack M. Choules

Telephone No. 571-272-2100

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US04/24565

Continuation of B. FIELDS SEARCHED Item 3:

EAST: USPAT, JPO, EPO, USPGPUB, DERWENT, IEEE Eplore: all, Portal: ACM Digital Library, PLUS: USPAT

search terms: recover, repair, rebuild, restore, correct, page, block, file, table, indeex, data, log, corrupt crash, faillure, error, background, thread, process, task, extensible, add, delete, modify, policy, detect, handle, notify.

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
STEVEN J. ROCCI
WOODCOCK WASHBURN LLP
ONE LIBERTY PLACE, 46TH FLOOR
PHILADELPHIA, PA 19103

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Applicant's or agent's file reference MSFT-4439		Date of mailing (day/month/year) 04 NOV 2005
FOR FURTHER ACTION See paragraph 2 below		
International application No. PCT/US04/24565	International filing date (day/month/year) 29 July 2004 (29.07.2004)	Priority date (day/month/year) 03 May 2004 (03.05.2004)
International Patent Classification (IPC) or both national classification and IPC IPC(7): G06F 17/30 and US Cl.: 707/202, 714/16, 19, 20		
Applicant MICROSOFT CORPORATION		

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-8300	Date of completion of this opinion 13 October 2005 (13.10.2005)	Authorized officer Jack M. Choules Telephone No. 571-272-2100
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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US04/24565

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:

- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing
- ☐ table(s) related to the sequence listing

b. format of material

- ☐ on paper
- ☐ in electronic form

c. time of filing/furnishing

- ☐ contained in the international application as filed.
- ☐ filed together with the international application in electronic form.
- ☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US04/24565

Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>4-10, 14-20 and 24-30</u>	YES
	Claims <u>1-3, 11-13, 21-23</u>	NO
Inventive step (IS)	Claims <u>NONE</u>	YES
	Claims <u>1-30</u>	NO
Industrial applicability (IA)	Claims <u>7-9 and 17-19</u>	YES
	Claims <u>1-6, 10-16 and 20-30</u>	NO

2. Citations and explanations:

Please See Continuation Sheet

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/24565

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

V. 2. Citations and Explanations:

Claims 1-3, 11-13 and 21-23 lack novelty under PCT Article 33(2) as being anticipated by Bullock et al. [hereinafter Bullock] "Recovery of Data Pages After Partial Page Writes."

As to claims 1, 11, and 21, Bullock teaches a database system (DBS) comprising: "An automated data reliability system (DRS) for a database file system (DBFS), said DRS comprising: a set of policies for performing database administration (DBA) tasks" (page 69 and 70, since the database is automatically recovered by a utility following particular protocols and procedures, the policies to use them must be coded into the utility); "a subsystem for responding to a set of data corruptions at a page level" (page 71, first full paragraph); "a subsystem for a first level of recovery for attempting to repair a corrupted page" (pages 74-76, paragraph bridging pages 74 and 75 through first paragraph on page 76); "and a subsystem for a second level of recovery for attempting to rebuild or restore a corrupted page if said corrupted page cannot be repaired" (page 70, second full paragraph through third full paragraph).

As to claims 2, 12, and 22, Bullock teaches "The system of claim 1 wherein said subsystem for a second level of recovery for rebuilding or restoring a corrupted page comprises a subsystem for addressing index page corruptions" (page 70-71 paragraph bridging the two pages).

As to claims 3, 13, and 23, Bullock teaches "The system of claim 1 wherein said subsystem for a second level of recovery for rebuilding or restoring a corrupted page comprises a subsystem for addressing data page corruptions" (page 79, third full paragraph through fourth full paragraph, description of the full subsystem process continues through page 83).

Claims 4, 7-10, 14, 17-20, 24 and 27-30 lack an inventive step under PCT Article 33(3) as being obvious over the prior art as applied in the immediately preceding paragraph and further in view of Elliott et al [hereinafter Elliott] US patent No. 4,945,474.

As to claims 4, 14, and 24 Bullock does not describe "The system of claim 1 wherein said subsystem for a second level of recovery for rebuilding or restoring a corrupted page comprises a subsystem for addressing page corruptions in a log file." However Elliott does show "addressing page corruptions in a log file" (column 8 lines 44-61).

It would have been obvious to one of ordinary skill in the DP art at the time of the applicant's invention to combine system of Elliott with that of Bullock as Bullock teaches that his system is an improvement to that of Elliott (page 69 through 71, paragraph bridging pages 69 and 70 through first full paragraph on page 71) and thus it would be obvious to apply the functions in Elliott that address areas not addressed in Bullock because they refer to the same basic system and this would improve the overall functionality and utility.

As to claims 7, 17, and 27 Bullock describes "A system for attaching and bringing online a data store for a database file system (DBFS), said system comprising: a subsystem for attaching said data store (page 69 through 71, first full paragraph on page 69 through first full paragraph on page 71, note: on system restart all connected data stores are attached and brought online); a subsystem for running a crash

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US04/24565

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

recovery and attempting to bring the data store online (page 71 first full paragraph, and page 74-76 paragraph starting on page 74 and ending on page 75 through the first full paragraph on page 76); a subsystem for determining if the attempt to bring the data store online is not successful (page 79, first and second full paragraphs); a subsystem for evaluating a database associated with said data store to determine if the database is transactionally consistent (page 79, first and second full paragraphs, Note see application page 12, paragraph 30 for so if it completes and there are no data page errors where data remains missing of its condition is unknown the database is consistent);

However Bullock does not specify "a subsystem for delaying repairs if said database is transactionally consistent until said crash recovery is complete." However Elliott does specify leaving certain repairs until the current restart or attach process is completed (figure 5, index 284 and column 10, lines 48-52). Same reasons as given above apply to why combination is obvious.

As to claims 8, 18, and 28, Elliott describes "The system of claim 7 further comprising a subsystem attempting a page level restoration and, if the page level restoration fails, ascertaining if the failure is due to an index page and, if so, rebuilding said index page when the attempt to bring the data store online is not successful and when the database is transactionally consistent" (figure 5, index 284, and column 10, lines 48-52).

As to claims 9, 19, and 29, Elliott describes "The system of claim 7 further comprising a subsystem for taking the database offline and attempting an emergency repair when the attempt to bring the data store online is not successful and when said database is not transactionally consistent" (column 8, lines 44-61).

As to claims 10, 20, and 30, Bullock describes "attempting a page level restoration (page 71, first full paragraph); "and a subsystem for determining whether the page level restoration fails or is unavailable" (page 79, second full paragraph), "further comprising: a subsystem for attempting an index recovery when the failure is for an index page (page 70-71 paragraph bridging the two pages); and "a subsystem for attempting a data page recovery when the failure is for a data page" (page 79, third full paragraph through fourth full paragraph, description of the full subsystem process continues through page 83).

Bullock does not specifically detail "A system for resolving an error encountered by a query engine during a transaction to a corrupt data store attached to a database file system (DBFS), said system comprising: a subsystem for aborting said transaction and attempting a page level restoration;" or "a subsystem for attempting an emergency repair when the failure is due to a log page error; and a subsystem for attempting to restore the entire database when the failure is an unrecoverable error." Elliott describes "A system for resolving an error encountered by a query engine during a transaction to a corrupt data store attached to a database file system (DBFS), said system comprising: a subsystem for aborting said transaction (column 10, lines 7-15)" or "a subsystem for attempting an emergency repair when the failure is due to a log page error" (column 8, lines 44-61); and a subsystem for attempting to restore the entire database when the failure is an unrecoverable error" (column 8, lines 52-55).

Claims 5, 15 and 25 lack an inventive step under PCT Article 33(3) as being obvious over the prior art as applied in the immediately preceding paragraph and further in view of Black et al [hereinafter Black] US Patent No. 6,671,699 B1.

As to claims 5, 15, and 25, Bullock does not detail "The system of claim 1 further comprising an interface for adding, deleting, and modifying at least one functionality from among the following group of functionalities: error and event notifications, policies, and error/event handling algorithms." However Black describes "an interface for adding, deleting, and modifying at least one functionality from among the following group of functionalities: error and event notifications, policies, and error/event handling algorithms" (column 36, lines 30-55).

It would have been obvious to one of ordinary skill in the DP art at the time of the applicant's invention to combine the teachings of Black with the system of Bullock Because allowing modifying of the policies to allow for the policy to be adjusted to address the specific behavior of an upgrade or release or to incorporate a new approach for dealing with faults (column 36, lines 30-55) or remove a policy that proves to not be effective improving the versatility of the DBS.

Claims 6, 16 and 26 lack an inventive step under PCT Article 33(3) as being obvious over the prior art as applied in the immediately preceding paragraph and further in view of Microsoft Press Computer Dictionary [hereinafter Dictionary].

As to claims 6, 16, and 26, Bullock does not detail "The system of claim 1 wherein said DRS operates as a background thread." However the Dictionary describes a background process or thread showing such to be well known in the art (page 39).

It would have been obvious to one of ordinary skill in the DP art at the time of the applicant's invention to combine the teachings of the Dictionary with the system of Bullock because Bullock teaches that his system provides automatic handling of crash recovery (page 69, first full paragraph) automatic meaning no user input so this could run in the background allowing the user to focus on other tasks needing his attention increasing the utility of the DBS.

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Claims 1-6, 10-16 and 20-30, lack industrial applicability as defined by PCT Article 33(4).

As to claims 1-6 and 10 is directed to "An automated data reliability system (DRS)" even though it is called a system it is embodied in the specification (page 9, paragraph [0019]) as a thread, referring to a process, which is a software construct. Further the examiner finds no positive recitation of any tangible element. The recitation of "*for* a database file system (DBFS)" (emphasis added) is not a positive recitation as it is a recitation of the intended use, further the DBFS can be considered to refer to the management software also not tangible. Further a page is a data construct that although related to storage is not recited as being embodied on any storage. Thus the claims are not tangible.

Claims 11-16 and 20 are methods each including steps to the process to implement the system of claims 1-7 and 10: the steps of the Method do not require use of hardware to accomplish the step. Thus the claims are not tangible.

Claims 21-30 are not limited to tangible embodiments. In view of Applicant's disclosure, specification page 19, paragraphs [0055] and [0056], the medium is not limited to tangible embodiments, instead being defined as including both tangible embodiments (e.g., a tangible or storage medium) and intangible embodiments (e.g., a transition medium). As such, the claim is not limited to industrial applicable subject matter. To overcome this the claims need to be amended to include only the physical computer media and not a transmission media or other intangible or non-functional media.

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under Article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the *PCT Applicant's Guide*, a publication of WIPO.

In these Notes, "Article," "Rule" and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Preliminary Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When? Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How? Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.